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A NEW DICRANOMYIA ALLIED TO DICRANOMYIA IMMODESTA OSTEN SACKEN—TIPULIDAE, DIPTERA

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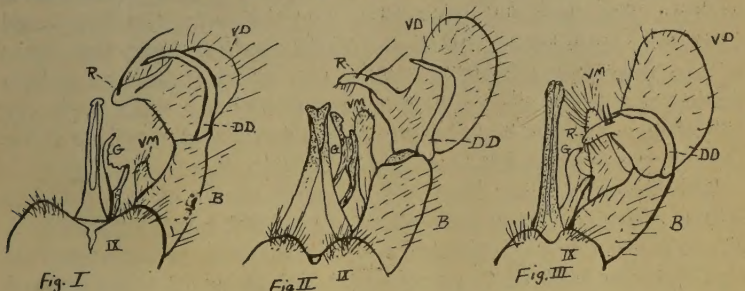
During the past few years of ecological and distributional studies on the crane-flies, I have had considerable difficulty in



EXPLANATION OF FIGURES

Figure I. Male genitalia of D. gladiator O. S., dorsal view.
Figure II. Male genitalia of D. immodesta O. S., dorsal view.
Figure IIa. Gonopophysis of D. immodesta O. S., side view.
Figure III. Male genitalia of D. iowensis sp. nov., dorsal view.
Figure IV. Wing of D. iowensis sp. nov.

B—Basistyle
DD—Dorsal dististyle
VD—Ventral dististyle
R—Rostrum
IX—Ninth Tergite
VM—Ventro-mesal lobe of basistyle
G—Gonopophysis.

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distinguishing Osten Sacken's species, *Dicranomyia immodesta* and *gladiator*. Part of the difficulty has been due to the existence of a third species, heretofore undescribed, whose geographic range and habitat distribution overlaps that of the above species.

Dicranomyia iowensis sp. nov.

Resembles in venation, size, and general body appearance *Dicranomyia immodesta* and *gladiator*. Differs from both of these species in that the thoracic notum and pleura are opaque, the antennae wholly dark brown, and the male genitalia distinctly different.

Rostrum straw yellow, tinged with brown at the apex and along the sides. Basal half of the first segment of the palpus yellow, the distal half and the remaining joints a dull dark brown. The antennae are dark brown thruout; the first basal joint long cylindrical, the second hardly half as long, the joints of the flagellum elliptical, with a few short setae and a thin pubescence. The vertex bright chestnut brown with a silvery reflection; occiput dark brown with a narrow silvery line along the margin of each eye.

The thoracic notum is a dull yellowish brown except that the lateral margins of the prescutum are a light opaque yellow. A single central dull brown stripe is well marked on the pronotum and anterior half of the prescutum but fades into the ground color on the posterior part of the prescutum. The usual position of the lateral stripes is frequently indicated by faint darker areas on the posterior half of the prescutum. The lobes of the scutum are faintly darkened; the scutellum and postnotum are slightly duller and darker than the rest of the thoracic notum. The pleura are a dull grayish yellow, somewhat lighter dorsally. The coxae and proximal halves of the femora are dull yellow, the distal halves of the femora and the tibia somewhat darker and the tarsi brown. The base and stem of the halters are yellow, the knobs dull, dark brown. The wings are entirely clear, save for a very faint, small, ovoid brown stigma. The veins are brown, the venation (figure IV) quite like that of *D. immodesta.*

The tergites of the abdomen are dull brown, the sternites yellow, more or less suffused with brown. The margins of the sternites are slightly shining. The genitalia of both male and female are yellow; altho dull, this yellow is conspicuous in contrast to the brown abdominal tergites. The ninth tergite of the

male genitalia is broad and short with a deep, rounded, caudal notch. The rounded lateral lobes produced by the notch are chitinized on their caudal margins which bear about fifteen long, yellow setae. The basistyles are a little longer than broad, thinly covered with long, yellow setae. From their ventro-mesal margins large fleshy lobes, about as long as the basistyle itself, project caudo-ventrad, almost parallel from the base to apex. These lobes are covered with a moderate pubescence and bear numerous setae, particularly at their apices. The dorsal dististyle is an arcuated, cylindrical, chitinized rod, slightly dilated at the base and just before the apex. Beyond the second slight dilation it tapers abruptly to a short, stout, straight, apical spine. A chord drawn from apex to base of the dorsal dististyle is very nearly equal to the length of the basistyle. The ventral dististyle is a large, inflated, ovoid lobe covered with a short pubescence and bearing rather scattered setae of moderate length. At midlength it is a little less in diameter than the chord of the dorsal dististyle and is a little less than twice as long. On the mesal margin, about one fourth of its length from the proximal end, the ventral dististyle bears a prominent, fleshy rostrum, curved dorsocephalad. Near the base of the rostrum, on its caudo-dorsal face are two short, stout, chitinized spines set close together in a common groove. These spines are almost exactly equal in length. The cephalic face of the rostrum, near its tip bears five or six stout setae. The penis guard is long and subcylindrical. It narrows from a dilated base to a slender rod but becomes slightly dilated just before the faintly bilobed apex. The gonopophyses are prominent flat hooks, whose bases form vertical plates on either side of the penis guard and whose apices are directed dorsad. Between the base and apex each has a semicircular depression like the blade of a sickle, whose dorsal and concave edge is gently and slightly serrate.

The ovipositor is but slightly different from that of *immodesta* or *gladiator*, slightly shorter and more slender than in *gladiator*, the tergal valves more arcuated than in *immodesta*.

Holotype, male, Poweshiek Co., Iowa, Sept. 18, 1920 (Field Cat. No. 52).

Allotype, female, topotypic.

Paratopotypes, 4 males; paratypes: Poweshiek Co., Iowa, 3 males, 2 females, Oct. 10, 1920; 1 female, June 2, 1920; 1 female, Sept. 5, 1920. Hardin Co., Iowa, 2 females, May 20; 1920; 4 males, 2 females, May 21, 1920; 3 males, 4 females,

May 22, 1920. Harrison Co., Ind., 5 males, June 18, 1921; Jefferson Co., Ind., 1 male, June 11, 1921; Washtenaw Co., Mich., 1 male, Aug. 6, 1921; 1 male, Aug. 24, 1921; 2 males, July 12, 1922; 1 male, June 6, 1922 (T. H. Hubbell); 1 male, Aug. 17, 1922 (F. M. Gaige).

Part of the paratypes from Indiana and Iowa are placed in the collection of Dr. C. P. Alexander; the holotype, allotype and other paratypes are in the collection of the Museum of Zoology of the University of Michigan.

Figured with present species are the genitalia of the males of *D. immodesta O.S.* and *D. gladiator O.S.* as I have identified these species from Osten Sacken's descriptions and his figure of the male genitalia of *D. gladiator*. The characters shown in these figures are constant in the series of each of these species that I have before me and the differences in body markings: three stripes on the prescutum of *gladiator*, one stripe on the prescutum of *immodesta;* the mesosternum of *gladiator* with rounded brown spots between the fore and middle coxae, the mesosternum of *immodesta* unmarked, fits in each series with the genitalia figured. There is a slight discrepancy between the male genitalia figured by Osten Sacken for *gladiator* and that figured for the species I am identifying as *gladiator*. I believe that this discrepancy is not greater than is to be expected when it is remembered that Osten Sacken drew his figure from observations on the living insect, while the present figure is made from a mount cleared in KOH and drawn as seen with a compound microscope.

Dicranomyia iowensis would seem, from the slight data now available, to be somewhat more western than *immodesta* or *gladiator*. Altho taken with these two species in Washtenaw Co., Michigan it was far less common than either. In southern Indiana, *iowensis* is far less common than *gladiator* but not so rare as *immodesta*. However, southern Indiana has other supposedly western crane-flies, *Gonomyia kansensis* Al, *Tipula flavibasis* Al. and is close to the southern limits of *D. immodesta*. In Iowa neither *gladiator* or *immodesta* were taken in the two localities where *iowensis* was common.

The immature stages of *iowensis* are unknown, the adults have been taken in situations much like those from which *gladiator* and *immodesta* have been commonly found, moist flood plains of small streams, wet grassy areas near springs, and from grassy, slightly shaded ravines.

TWO NEW THYSANOPTERA FROM CUBA

J. R. WATSON

CEPHALOTHRIPS MERRILL N. SP.

Measurements—Total body length 0.87 mm. Head, length 0.14 mm, width 0.11 mm; prothorax, length 0.10 mm, width (including coxae) 0.18 mm; pterothorax, width 0.177; abdomen, greatest width 0.16 mm; tube, length 0.08 mm, width at base 0.055 mm, at apex 0.025 mm; Antennae, total length 0.25 mm.

Segment	1	2	3	4	5	6	7	8
Length	18	36	40	41	40	35	31	19
Width	25	23	21	22	22	19	17	11 microns.

Color an almost uniform light olive gray (Ridgeway's color standard); head and tip of abdomen darker, antennal segment 3 and all tibiae and tarsi lighter except a black spot near the tips of tarsi; eyes and ocellar crescents deep red and very conspicuous. *Head* a little longer than wide, broadly rounded in front except for a projection of the vertex between the basal segments of the antennae; cheeks gently arched, slightly converging posteriorly, vertex smooth without bristles except the rather long (about as long as the eyes) but very slender, pointed post-oculars and two pairs of minute ones along the margins of the eyes, one directly behind and one in front of each posterior ocellus. *Eyes* rather small, not protruding, non pilose. *Ocelli* large, the posterior pair situated opposite the anterior third of the eyes, the anterior directed forward. *Mouth cone* short, reaching the middle of the prosternum, and rounded at the tip. *Antennae* nearly twice as long as the head. Segment 2 short barrel-shaped with a broad peduncle; 3, top-shaped; 4, obovate; 5, oval; 6, cylindrical; 7, cylindrical but tapering somewhat apically; 8, conical, broadly united to 7; 3-6 with short narrow pedicels, 8 with a somewhat broader one: 1, concolorous with the head; 2, lighter at apex; 3, much lighter except extreme base (but pedicel light); 4, about concolorous with the head; 5-8, darker, deep olive gray. Bristles and sense cones short, pale and inconspicuous.

Prothorax, somewhat wider than the head, shorter than the head; sides rather sharply diverging posteriorly. A rather long but pale bristle on each posterior angle, an equally long one midway between this and the median dorsal line. A pair of minute ones near middle of posterior margin.

Pterothorax at the anterior margin about as wide as the prothorax (including coxae) but sides converge sharply posteriorly. Wing membrane pale gray, constricted in the middle, reaching to about the 8th abdominal segment, sparsely provided with rather long hairs, 4 inter-located ones.

Legs rather short. Fore femora considerably enlarged. Fore tarsi unarmed.

Abdomen rather slender, sides nearly parallel to about 8th segment then tapering abruptly to tube. Bristles rather short, pale and inconspicuous; those on the last segment larger. Terminal ones but little longer than the tube.

Described from a single male taken from a scale-infested cocoanut from Cuba by George B. Merrill of the Florida State Plant Board.

The color of this insect and the shape of the pterothorax, will enable it to be readily told from the other two species of this genus.

The following key will enable one to readily separate the species:

a.—Antennal segment 7 broadly united to 6.....*monilicornis* Reuter.

aa.—Antennal segment 7 pedunculate.

b.—Color dark brown; wings very short or entirely lacking; pterothorax narrower than prothorax, sides nearly straight and parallel, even; postoculars blunt .....*errans Moulton.*

bb.—Color light gray; wing membrane reaching abdominal segment 8; pterothorax wider than prothorax (exclusive of coxae), sides sinuate and sharply converging posteriorly; postoculars pointed *merrilli n. sp.*

FRANKLINELLA CEPHALICA BRUNERI N. VAR.

Female

Measurements: Total body length (average of 33 individuals) 1.02 mm. (varies from .82 to 1.25 mm.). Head, length 0.11 mm., width 0.16 mm.; prothorax, length 0.14 mm., width 0.19 mm.; mesothorax, width 0.27 mm.; abdomen, greatest width .28 mm.

Antennal segments	1	2	3	4	5	6	7	8
Length	26	42	58	54	41	51	9	12
Width	25	25	23	23	20	20	8	6 microns

Total length 0.28 mm.

Color, almost uniform yellow, thorax and end of abdomen a shade darker than the basal segments, head considerably lighter, pale yellow. No orange or brown color anywhere on the body except the yellowish orange ocellar crescents and a small orange spot on the extreme tip of the abdomen. Eyes black by transmitted light, red by reflected.

Head nearly half again as broad as long, considerably retracted into prothorax; cheeks slightly arched, bearing a pale short spine at about the middle; vertex smooth; frons depressed. Postoculars and a pair of bristles in front of each posterior ocellus nearly as long as the eyes, sharply curved, brown and conspicuous. A pale, slender, inconspicuous bristle at the inner posterior angle of each posterior ocellus, and a pair of even smaller bristles in front of the anterior ocellus. Eyes rather large, nearly half as long as the head, not protruding, pilose, facets large. Ocelli large, pale, posterior pair situated a little in front of the posterior border of the eyes, anterior directed somewhat forward into the frontal depression. Mouth cone long and slender, almost reaching the mesosternum. Maxillary palpus 3-segmented, the basal segment the longest.

Antennae 2.5 times as long as the head. Segment 1 short, cylindrical; 2 barrel-shaped with a wide peduncle, produced dorsally and bearing at the apex of the elevation two heavy bristles. These bristles are not as heavy as in *F. cephalica masoni* and the elevation is much less marked and does not project over the base of segment 3; 3 widest at about two-thirds its length, thence tapering uniformly with nearly straight sides to a narrow peduncle with several constrictions and to a broad apex. It bears a colorless dorsal, forked, trichome and below the base of this a pair of bristles which are fully as heavy and considerably longer than the corresponding ones on segment 2; 4, similar to 3 in shape but peduncle wider and shorter and sides not as straight. This segment also bears a forked trichome but on the inner side; 5 much the smallest of the intermediate

segments with a narrower peduncle than 4; 6 conical, but little constricted at the base; 7 cylindrical, considerably shorter than 8; 8 conical. 1 almost colorless, 2 almost uniformly light brown except the paler peduncle; 3 light Marguerite yellow (Ridgeway's color chart) clouded with darker gray in the apical third; apical half of 4 and 6 mummy brown (Ridgeway) basal half of 4 and often all of 5 Marguerite yellow, 5 sometimes clouded with brown in apical third, 7 and 8 a little lighter than 6.

Prothorax wider than long and wider and longer than the head, sides strongly arched. One bristle on each anterior angle and a pair on each posterior angle are unusually large and strongly curved. The longest on the posterior angle often reaches a length of 80 microns or nearly half the width of the prothorax; another stout bristle (but only about a third as long) at the anterior angle; on the anterior margin are a pair of bristles nearly as stout and four pairs of minute colorless ones.

Pterothorax much wider than the prothorax, anterior angles evenly rounded to the posterior margin of mesothorax. Metathorax narrower, sides nearly straight and parallel. Two large bristles and two smaller ones between the wings and two large ones and about 12 smaller ones along the anterior margin. Legs light brownish yellow, considerably lighter than the body. Tibiae provided with a pair of stout spines near the apex.

Wing membranes reaching to about abdominal segment 9, fore pair very light grayish yellow, provided with heavy bristles, about 25 on costa, 19-21 on anterior vein, and from 14 to 21 (usually 19) on posterior.

Abdomen, rather short and thick, widest at about segment 8, thence rounding rapidly to tenth segment. The posterior segments (5-9) provided with heavy, but comparatively short, curved bristles at the posterior angles. The 10th segment split open for not over a fourth of its length, tipped with orange at the extreme apex. Provided with about a dozen large straight brown bristles which extend far beyond the tip.

Male. Much smaller than the female, about 0.8 mm., pale yellow. Head, length 0.11 mm., width 0.15 mm.; prothorax, length 0.15 mm.; width 0.19 mm.; mesothorax, width 0.20 mm.; abdomen, width 0.15 mm. Antennae, segment 1, 25; 2, 39; 3, 49; 4, 46; 5, 38; 6, 46; 7, 7; 8, 11 microns. Total length 0.26 mm. Wings with about 22 strong bristles on costa, 16 on anterior vein and 13 on posterior. Second segment of antennae much lighter in color than in female; lighter than the first. Testes yellowish brown by transmitted light, yellow by reflected.

Larvae brownish yellow, legs and tip of abdomen lighter. Eyes dark.

Described from thirty females and four males collected by Dr. S. C. Bruner in Santiago de las Vegas and on the Peninsula de Guanahacabibes, Cuba, on oranges, avocadoes, hibiscus, *Moringa.* Type in the author's collection.

Close to *F. cephalica melanommatus* Bagnal, of which it is probably only a Cuban race, but differs in the color and form of the second antennal segment which projects but little dorsally and not at all forward over segment 3, in the larger number of spines on the posterior vein of the fore wings (in both sexes) and in the split end of the last abdominal segment, and especially in the long, stout, curved bristles.

It can be told at a glance from *F. cephalica masoni* by the lighter color and the character of the second antennal segment.

The

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MEETINGS OF THE SOCIETY

Dec. 11, 1925.—Meeting called to order by Vice-President Bates. Members present: Bates, Berger, Bratley, Hubbell, Merrill, Rogers, Watson; visitors: Grossman, Inman, Tissot.

Dr. M. D. Leonard of Orlando, entomologist of Wilson Toomer Fertilizer Co., was elected a member of the society.

Mr. Watson gave the paper of the evening on "The Reactions of Whiteflies to Light, Heat, Gravity, and Certain Chemicals with Some Comparisons with the Behavior of Scale Crawlers and Rust Mites to the Same Stimuli."

Jan. 8, 1926.—Meeting called to order by Secretary Bratley. Members present: Berger, Bratley, Gray, Hubbell, Merrill, Watson; visitors: Grossman, Inman, Tissot.

New members elected were E. F. Grossman, an Entomologist of the Experiment Station in charge of boll weevil investigations; M. T. Inman, of the Kay Research Company, who is experimenting with insecticides, and A. N. Tissot, Assistant Entomologist of the Experiment Station.

The following officers were elected for the year: President, Prof. John Gray; Vice-President, E. F. Grossman; Secretary, H. E. Bratley; Treasurer and Business Manager of the Entomologist, A. N. Tissot; Editor, J. R. Watson.

The paper of the evening was by Dr. E. W. Berger on "Some Mosquito Controls."

THE CITRUS APHID IN CUBA

The following letter from Mr. J. B. Anderson of Santa Clara in regard to the status of the new citrus aphid in Cuba should be of interest to our readers:

"Here in this province (Santa Clara) I have been pretty well over the groves, and find it universal; just this morning I was out to see some little recreation farms, owned by friends here in town. One place has about 20 trees, and the other, at a distance 10 miles removed from the first, has about 100 trees. Both are badly infested, although there is not active work going on now as there is no new growth.

"In this province, near the town of Manacas, near the Mantanzas province line, there are six German-American orange growers, with a total of about 100 acres of orange groves scattered over a dozen square miles, and all the groves have the aphis, being dormant at present, but having been worked pretty thoroly as shown by the hardened curled leaves.

"When I was in Camaguey a month ago, a Cuban grower with about 50 acres told me that all his trees were infected and also that all the other groves around were in the same shape; these are within 5 miles of Camaguey city.

"The La Gloria district, where my groves are, was gone over very thoroly by me just before I wrote you the first of the year; practically every grove is infected and much damage done.

"Thus I know personally that it has taken full charge of our groves in these central provinces.

"As to how long it has been a pest, I can say that I have noticed the characteristic tight curling of the leaves for the past three years, and they tell me in La Gloria that it has been there for four years, but never abundant enough to excite comment even. We just supposed that it was curling by dry weather or something like that. Just this year it shot out like wildfire all at once in all groves."

Mr. A. C. Mason, of the Bureau of Entomology, U. S. Dept. of Agric., who has been stationed at Lindsey, Calif., where he has been studying the California orange thrips, has been transferred to Hawaii, where he has taken up the study of the Mediterranean fruitfly.

NEW THYSANOPTERA FROM FLORIDA—XIII

J. R. WATSON

92. Podothrips semiflavus Hood.

Mr. George B. Merrill on October 1, 1924 collected a number of thrips of this species from a swamp grass collected at Davie by Bowers and Link of the State Plant Board. It has been reported from Cuba and Porto Rico on sugar cane. The writer has received it from the Virgin Islands when it was collected on Para grass by Mr. C. E. Wilson. The present find extends its known range to Florida and adds a new host.

93. Chirothrips obesus var. **hubbelli** n. var.

Female. Abdomen, pale brownish yellow (warm buff—Ridgeway's color standard) tip, darker (segment 10 raw umber); head raw umber; thorax yellowish brown (prothorax buckthorn brown, pterothorax mummy brown); legs empire yellow, all femora and middle and hind tibiae shaded with brown on outer side; antennal segments 1 and 2 lemon chrome, 3 pinard yellow, 4 buffy brown, 5 raw umber, 6 to 8 blackish brown.

Measurements: Total body length 0.7 mm.; head, length 0.09 mm., width 0.114 mm.; prothorax, length 0.125 mm., width (including coxae) 0.25 mm.; mesothorax, width 0.28 mm.; metathorax, width 0.25 mm.; abdomen, greatest width 0.28 mm.

Antennae

1	2	3	4	5	6	7	8
30	43	35	30	28	44	13	12 microns

Total length 0.23 mm.

Head, considerably wider than long, broadest across the posterior margin of the eyes, cheeks well arched, short, about a third the length of the eyes, front produced into a triangle in front of the eyes, the two front sides of this triangle (across the bases of the antennae) almost straight but slightly produced between bases of antennae, tip with minute notch; surface with several rather prominent longitudinal striations and a single pair of bristles near the anterior angles of the eyes.

Eyes rather large, dark, pilose. Ocelli situated more anteriorly than in most species of the genus, posterior pair about opposite the middle of eyes, bordered by wide dark red crescents. Mouth cone reaching rather more than half way across prosternum.

Antennae 2.5 times as long as head. Segment 1 rounded, about three-fourths as long as wide; 2 inverted foot-shaped, but the "toe" very short, the axis and the width along apical margin about equal; 3 pyriform with a short peduncle; 4 and 5 suboval. Very thick, curved, colorless, sense cones on inner margins of segments 3 and 4, a few short, inconspicuous bristles on segments 5 to 8.

Prothorax trapezoidal in shape, sides diverging sharply posteriorly, quite deeply indented above fore coxae. Both anterior and posterior angles

sharp, destitute of conspicuous bristles. Pronotum with anastomozing striae and about 12 pairs of small bristles.

Sides of mesothorax very convex, of metathorax only slightly so and diverging posteriorly.

Fore legs short and much thickened.

Wings very long (length ten times the greatest width), much exceeding the tip of the abdomen, curved, shaded with gray, fore pair deeply so but with a clear area just above the base, sparsely fringed with long hairs for its entire length. Posterior veins of fore wings branch off from the anterior at the apex of the clear area (about a fifth of the length) bearing but two spines, one near the middle and another towards apex. Anterior vein with four spines, two near the base and two near apex.

Abdomen short and thick. Segment 10 split open above. Segment 9 also narrow. Spines on segments 8 to 10 moderately long. Receptaculum seminis over base of ovipositor bright reddish orange.

Male unknown.

Described from a single female taken in Dixie County, Florida, from grass and roots at margin of a cypress pond, by T. H. Hubbell, Nov. 28, 1925. Type in the author's collection.

Close to *E. obesus* Hinds, but differs in the shorter head, the more anterior position of the ocelli, the longer antennae, the less compressed first antennal segment, the shorter projection on the second segment, the diverging sides of the metathorax, the wings with a complete fringe of hairs and fewer bristles on the veins, and the absence of a long spine on the posterior angle of the prothorax. From *C. spinceps* Hood it differs in size, the fewer spines on the front of the head, the longer prothorax and the shape of the fore tibiae.

KEY TO NORTH AMERICAN SPECIES OF CHIROTHRIPS

1. A single longitudinal vein in each fore wing.....*mexicanus.*
2. Two longitudinal veins in each fore wing; fore wings brown.
   - a. Two long, stout spines at each posterior angle of the prothorax.
     - b. Antennal segment 6 about as long as 4 and 5 together. —*insolitus.*
     - bb. Segment 6 shorter than 4 and 5 together.....*manicatus.*
   - aa. A single long, stout spine at each posterior angle.....*spiniceps.*
   - aaa. Spines at the posterior angles of the prothorax only moderately long.
     - b. Body uniformly brown.
       - c. Only one moderately heavy bristle on each posterior angle of prothorax; antennal segment 5 nearly as thick as 4. —*floridensis.*
       - cc. Two shorter bristles on each posterior angle of prothorax, antennal segment 5 much smaller than 4. —*floridensis catchingsi.*

bb. Abdomen lighter.

c. Abdomen gray brown or yellowish brown; length 0.78 mm. —*crassus.*

cc. Abdomen yellow.

d. Thorax yellow ochre shaded with gray; length about 1.1 mm.; front of head with numerous small spines. —*vestis.*

dd. Thorax yellowish brown; length 0.7 to 0.8 mm.; front of head with one or two pairs of spines.

e. Posterior ocelli opposite posterior border of eyes; each vein of fore wing with 4 to 6 spines.— —*obesus.*

ee. Posterior ocelli opposite middle of eyes; anterior vein with 4, posterior with 2 spines. —*obesus hubbelli.*

94. Liothrips muscorum n. sp.

Male.

Color, including even the tarsi of the legs, a uniform dark brown, thorax and abdomen with much blood red hypodermal pigment, antennal segments 3-6 mostly yellow.

Measurements: Total body length 1.17 mm. Head, length 0.22 mm., width, 0.185 mm.; prothorax, length 0.127 mm.; width (including coxae) 0.29 mm.; pterothorax, greatest width 0.33 mm.; abdomen, greatest width 0.34 mm.; tube, length 0.15 mm., width at base 0.06 mm., at apex 0.037 mm.

Antennae, segment 1, 30; 2, 43; 3, 80; 4, 74; 5, 63; 6, 61; 7, 51; 8, 32 microns.

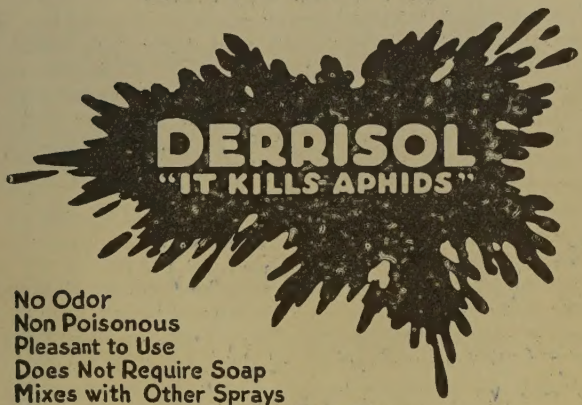
Total length, 0.44 mm.

Head but little longer than wide, widest some distance behind the eyes, cheeks arched, converging quite sharply posteriorly, dorsal surface finely striated. Postocular bristles about .6 the length of eyes, blunt. Eyes rather large but diameter somewhat less than the distance between them, dark, not pilose. *Ocelli* straw colored, posterior ones contiguous to the inner margins of the eyes in front of their middle, the anterior one facing forward, inconspicuous, on a line with the anterior border of the eyes.

(To be continued.)

The State Plant Board has at the Lake Alfred Station nearly a thousand of the Chinese lady beetles (*Leis* sp.) for distribution to the growers as soon as the citrus aphid becomes sufficiently abundant to insure a constant food supply. These lady beetles have been bred by Mr. W. L. Thompson. There are also a few hundred of these beetles at the Experiment Station at Gainesville where they have been bred by Mr. H. E. Bratley. At both places they have been mostly dormant during December and January.

The New Spray for Aphis



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The State Plant Board has secured the services of Mr. R. L. Miller to take charge of the experiments in control of the new citrus aphid which are being conducted at the Citrus Substation at Lake Alfred. Mr. Miller secured his master's degree at Ohio State at the close of the fall quarter there.

Now is the time to spray trees affected with rust mite, scab or melanose. We handle the

DRY LIME SULPHUR

It saves freight on water and expense of handling. Shipped in air-tight packages with removable top. Will keep indefinitely if top is replaced after using. Dissolves readily in any water. Add Dry Lime Sulphur to water and stir. Five pounds to one hundred gallons water for rust mite, equivalent to two gallons 33° Lime Sulphur Solution to one hundred gallons of water. Prices range from 10½ to 25c per pound according to quantity order.

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"BLACK LEAF 40"

(Sulphate of Nicotine—40% of Nicotine)

For liquid spraying against aphis, thrips, leaf-hoppers, etc. May be combined with other standard spray-chemicals. Always dependable and efficient.

"Black Leaf 40" is, in Very Truth, "The Old Reliable"

PRICES

½-lb. tin	$ 1.25
2-lb. tin	3.50
10-lb. tin	13.50

"BLACK LEAF"-FI-NICOTINE DUST

Contains Over 1¼% of Actual ("Free") Nicotine

Made from our own high-strength ("Free") Nicotine. Thoroughly standardized as to strength and texture. Recommended for dusting vegetables to destroy aphis.

PRICES

F. O. B. Richmond, Va.

5-lb. tin	$ 1.10
25-lb. drum	3.75
50-lb. drum	6.75
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"BLACK LEAF"-F2-NICOTINE DUST

Contains Over 2% of Actual ("Free") Nicotine

Is stronger in nicotine than our—F1—Dust, but otherwise, is the same. Recommended against the more resistant insects, such as cucumber beetle, pea aphis, etc.

PRICES

F. O. B. Richmond, Va.

5-lb. tin	$ 1.30
25-lb. drum	4.75
50-lb. drum	8.75
100-lb. drum	16.75

"Black Leaf" products are sold by seedsmen, hardware stores, drum stores, general merchants, and dealers in horticultural supplies.

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Calcium Cyanide is recommended to control gophers, salamanders, turtles, land crabs, ants, chinch bugs, rats, nematodes, grubs, moles, citrus aphis, besides numerous other pests in many parts of the world.

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